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METHYL BROMIDE FUMIGATION

- For purpose of these regulations, field soil fumigation does not apply to:
 - Golf courses
 - Tree holes
 - Potting soil
 - Raised tarp fumigation and nursery fumigation < 1 ac.
 - Greenhouses & other similar structures

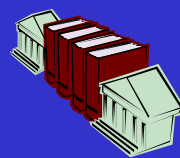


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METHYL BROMIDE FUMIGATION OVERVIEW

- Regulation changes – shown in orange*
- Monthly air concentration limit
- Worksite plan
- Notification requirements
- Buffer zones
- Fumigation methods
- Worker safety
- CEQA



* Changes since the January 14, 2001 version are shown in red

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METHYL BROMIDE REGULATION CHANGES

- 6450: Clarifies handling includes supervision
- 6450(a): Worksite plan revisions
- 6450(d): Blocks greater than 40 acres allowed if approved by DPR
- 6450(e): Unapproved tarps allowed under RA
- 6450(h): Monthly air concentration limit
- 6450.1(b)(1) Notification in English and Spanish

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METHYL BROMIDE REGULATION CHANGES

- 6450.2(a): Buffer zone tables in regulation
- Buffer Tables: Strip fumigation added; deep/tarp emission ratio revised
- 6450.2(e)(1): Minimum inner buffer zone revised from 50 ft to 30 ft
- 6450.2(g): Employee notification in manner he/she understands
- 6450.3(b): No entry during REI except tarp cut, removal, or repair; or full-face respirator

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METHYL BROMIDE REGULATION CHANGES

- 6784(b)(2)(C): Respirator with specific cartridge allowed for some activities
- 6784(b)(3)(A): Revised work hours for employees handling methyl bromide more than 3 days/month
- 6784(b)(3)(C): Can't handle methyl bromide for 30 days in order to change 3-day employee designation
- 6784(b)(5)(B): Tarp repair plan includes response time of person repairing

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MONTHLY AIR CONCENTRATION LIMIT

Ambient air concentration must not exceed 9 ppb as an average daily level in a calendar month.

- Protects the public against seasonal or subchronic exposure
- Several methods to ensure concentration limit is not exceeded

3CCR 6450(h)

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TOWNSHIP CAP

- Methyl bromide use does not exceed 270,000 lbs in any township during any calendar month
 - DPR will identify townships that may reach cap
 - Townships in Monterey, Santa Cruz, and Ventura may exceed cap for Aug – Sep
 - CACs should track use and deny NOIs when cap reached
 - Option to track on consecutive 30-day basis

ALLOCATION PLAN

- CACs coordinate with growers and applicators to allocate methyl bromide prior to peak season
 - Allocation cannot exceed 270,000 lbs in any township during any month



INCREASED BUFFER ZONE SIZE

- Buffer zones may be increased to raise or eliminate the township cap
 - CACs need to estimate highest monthly use
 - Increase emission ratios for all applications in the township-month by proportional amount
 - Example: If CAC estimates that 300,000 lbs may be used, emission ratios are increased by 11% $[(300,000 - 270,000)/270,000]$

WORKSITE PLAN

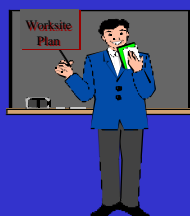
- Operator of property shall submit a worksite plan
 - To the Commissioner (CAC)
 - 7 days prior to submitting notice of intent (NOI)
- CAC shall retain the worksite plan for 1 year after expiration of permit



3CCR 6450

WORKSITE PLAN

- Worksite Plan will include
 - Method of fumigation
 - Acreage and identification of each application block
 - Application rate
 - Notification procedures
 - Work day and work hrs restrictions
 - Tarp repair response and removal plan
 - Description of any activities within buffer zones
 - Description of work day, work hrs limitation/respiratory protection



PERMIT CONDITIONS

CAC shall include the following:

- Evaluation of local conditions and proposed worksite plan
- Size and duration of buffer zone
- Work day and hour restrictions
- Respirator Number and Type
- Specific notification procedure
- Restrictions to address local conditions
- Tarp repair response and removal plan



NOTIFICATION REQUIREMENTS

- Notification of Property Operators within 300 feet from perimeter of Outer Buffer Zone that a permit to use MeBr near their property has been issued. **The notification must be also in Spanish**
- Notification to employees when buffer zones extend into other properties shall be in **a manner they understand**
- NOI to CAC 48 hours prior to application

3CCR 6450.1

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INITIAL NOTIFICATION

- At least 7 days prior to submitting NOI
- Include :
 - Chemical name
 - Name, address, and telephone number of operator of property and CAC
 - Earliest and latest dates the fumigation will start
 - How to request subsequent notification

3CCR 6450.1(b)

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SPECIFIC NOTIFICATION

48 hours prior to fumigation :

- Provide to all requesting persons within 300 feet of outer buffer zone:
 - Date(s) and time(s) of fumigation
 - Buffer zone expiration

3CCR 6450.1(b)(2)

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EXERCISES WORKSITE PLAN



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METHYL BROMIDE BUFFER ZONE

DEFINITION :

The area that surrounds a pesticide application block in which certain activities are restricted for a specified period of time to protect human health and safety from existing or potential adverse effects associated with a pesticide application **as it applies to Methyl Bromide application**

3CCR 6000

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BUFFER ZONES GENERAL RULES

- Measured from edge of application block
- Restrictions begin at start of injection
- In effect at least 36 hours after completion of injection
- If school is within 300 ft of the perimeter of the outer buffer zone, the injection shall be completed **at least** 36 hrs prior to the start of a school session

3CCR 6450.2(i)

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BUFFER ZONES TYPES

- Two types
 - Inner**
 - Not less than **30 feet**
 - Limited to transit and fumigation handling activities
 - Outer**
 - Not less than 60 feet
 - Limited to transit, fumigation handling activities, and activities approved by CAC
 - No persons are allowed more than 12 hours in 24 hours

3CCR 6450.2(d,e,f)

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BUFFER ZONES

Inner buffer zone may extend into:

- Agricultural property if...
 - Written permission is received
 - Buffer zone boundary is posted
 - Workers are notified **in a manner they understand**
- Roadways and similar sites used for travel

3CCR 6450.2(e)(3)

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BUFFER ZONES

Outer buffer zone may extend into:

- Other property:
 - With permission from other property operator
 - No occupied housing within buffer zone
 - No schools, convalescent hospitals or sensitive sites on property
 - Workers are notified **in a manner they understand**
- Roads, highways, similar sites

3CCR 6450.2(f)(3)

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BUFFER ZONES

- Dependent on
 - Size of application block
 - Time & distance from nearby MeBr field fumigation
 - Application rate
 - Fumigation method
 - Emission ratio
 - Other factors

6450.2(a)

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BUFFER ZONE APPLICATION BLOCK

- Field or portion of field treated in a 24 hour period
- Typically identified by visible indicators, maps or other tangible means
- Shall not exceed 40 acres **unless approved by the director**

3CCR 6000/6450(d)

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BUFFER ZONE APPLICATION BLOCK

- Time and Distance From Other Fumigation
 - Off-gassing from fields in close proximity combines to increase the concentration of MeBr in the air near both locations
 - Classify proposed application blocks
 - Isolated Blocks
 - Non-Isolated Blocks

GUIDANCE MANUAL

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BUFFER ZONE APPLICATION BLOCK

Isolated Blocks

- Separated by a minimum of 1,300 feet
- or
- Separated by at least 36 hrs from end of injection to beginning of next fumigation

GUIDANCE MANUAL

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BUFFER ZONE APPLICATION BLOCK

Non-Isolated Blocks

- Closer than 1,300 feet away
- and
- Less than 36 hrs from the end of injection to beginning of next fumigation

GUIDANCE MANUAL

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BUFFER ZONE APPLICATION RATE

- Calculation
 - Pounds per acre of active ingredient in formulated product
- MeBr 57/43 at 360 # / acre
- Rate = $360 \times 57\%$ or $360 \times .57 = 205.2\# / \text{acre}$

GUIDANCE MANUAL

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BUFFER ZONE EMISSION RATIO/RATE

- **Emission ratio:** rate of MeBr volatilized based on fumigation method (listed in the guidance manual)
- **Emission rate:** emission ratio X application rate
- Adjust rate if strip fumigation

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BUFFER ZONE TABLES

- Table 1: Fumigation methods and emission ratios
 - Strip fumigations added
 - Tarp/Deep emission ratio revised from 0.40 to 0.25
- Tables 2 & 3: Outer buffer zone
- Table 4: Inner buffer zone
 - Minimum inner buffer revised from 50 to 30 ft
- Table 5: Buffer zone duration

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FUMIGATION METHODS GENERAL REQUIREMENTS


Requirements include:

- Purging of lines
- Air fan dilution
- Chisel modifications
- Approved tarp
- Tarp permeability factor: 5-8, unless RA
- Injection depth
- Bury ends 4 inches

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FUMIGATION METHODS

FUMIGATION LINE

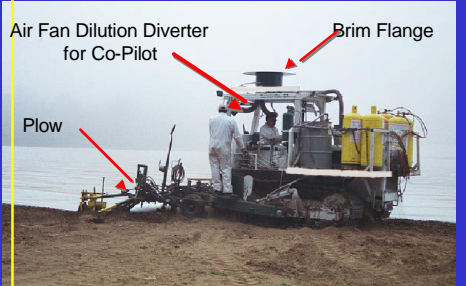


Fumigation lines being purged

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FUMIGATION METHODS

AIR FAN DILUTION



Air Fan Dilution Diverter for Co-Pilot

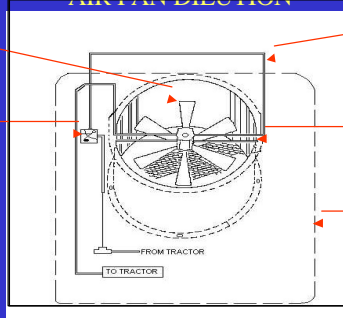
Brim Flange

Plow

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FUMIGATION METHODS

AIR FAN DILUTION



SIX BLADE AXIAL FAN
0-45 MPH
At least 43 inches wide

SPEED SWITCH

3500 PSI HYDRAULIC HOSE (TYP)

FAN STABILIZER

CANOPY ROOF

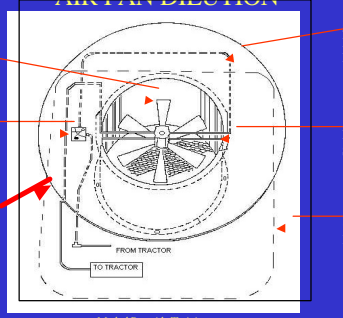
FROM TRACTOR

TO TRACTOR

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FUMIGATION METHODS

AIR FAN DILUTION



SIX BLADE AXIAL FAN
0-45 MPH
At least 43 inches wide

SPEED SWITCH

3500 PSI HYDRAULIC HOSE (TYP)

FAN STABILIZER

CANOPY ROOF

BRIM FLANGE

FROM TRACTOR

TO TRACTOR

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FUMIGATION METHODS

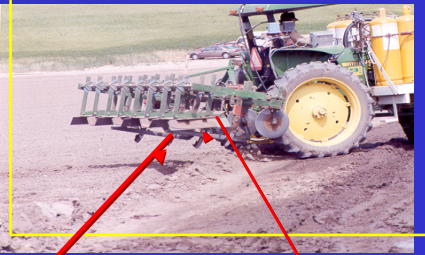
CHISEL TYPES

- Rearward-curved (swept-back)
- Forward-curved
- Nobel Plow
- Winged (obsolete)

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FUMIGATION METHODS

REARWARD-CURVED CHISEL



Rearward-curved chisel

Bed Shaper

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FUMIGATION METHODS
REARWARD-CURVED CHISEL

Disc

Bed Shaper

Closing Shoes

Rearward Curved Chisel

The chisel is curved away from the direction of the tractor And therefore called "Rearward"

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FUMIGATION METHODS
FORWARD-CURVED CHISEL

Tire is Closing Shoe

Chisel

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FUMIGATION METHODS
WINGED CHISEL

ABSOLUTELY NOT

WINGED CHISEL

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FUMIGATION METHODS
NON-TARP/SHALLOW/BED

- Maximum rate: 200 pounds/acre
- Air fan dilution system required on the application tractor
- Rearward-curved chisel used with:
 - Closing shoes and bed shaper, or closing shoes and compaction roller; and
 - Chisel injection points positioned beneath and ahead of the closing shoes

3CCR 6450.3(a)(1)

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FUMIGATION METHODS
NON-TARP/SHALLOW/BED

- Injection depth 10 to 15 inches
- Injection spacing 40 inches or less
- Do not disturb soil for 3 days (72 hours) following completion of the injection
- REI 3 days (72 hours)

3CCR 6450.3(a)(1)

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FUMIGATION METHODS
NON-TARP/DEEP/BROADCAST

- Maximum rate: 400 pounds/acre
- Forward-curved chisel
 - Air fan dilution system required on the application tractor and a minimum injection depth of 20 inches
- or**
- Closing shoes and compaction roller and minimum injection depth of 24 inches
- Injection spacing 68 inches or less
- Do not disturb soil for 4 days (96 hours) following completion of the injection
- REI 4 days (96 hours)

3CCR 6450.3(a)(2)

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FUMIGATION METHODS

TARP/SHALLOW/BROADCAST

- Maximum rate: 400 pounds /acre
- Application shall be made using either:
 - Air fan dilution system on application tractor, and a plow consisting of horizontal v-shaped blades

or

- Rearward-curved (swept-back) chisels, closing shoes, and compaction roller
- Injection depth shall be between 10 to 15 inches

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3CCR 6450.3(a)(3)

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FUMIGATION METHODS

TARP/SHALLOW/BROADCAST

- Injection spacing 12 inches or less
- Tarp laid simultaneously by application tractor
- Tarp cut after 5 days (120 hours)
- Remove tarp 24 hours after cut
- REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 6 days (144 hours)

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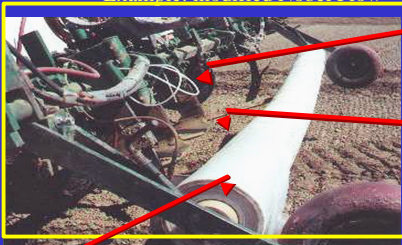
3CCR 6450.3(a)(3)

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FUMIGATION METHODS

V-SHAPED BLADES

Example: modified Nobel Plow



MeBr Injection Lines

Modified Nobel Plow, V-shaped blades

Tarp

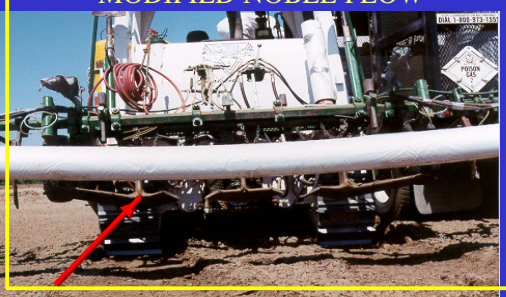
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FUMIGATION METHODS

MODIFIED NOBEL PLOW



Horizontal V-shaped Blades

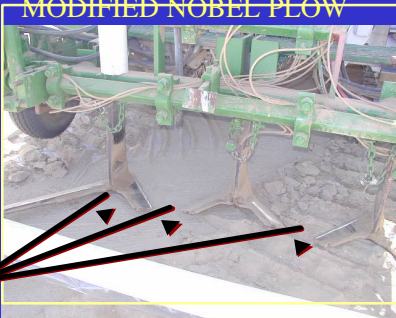
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FUMIGATION METHODS

MODIFIED NOBEL PLOW



Modified Noble Plow

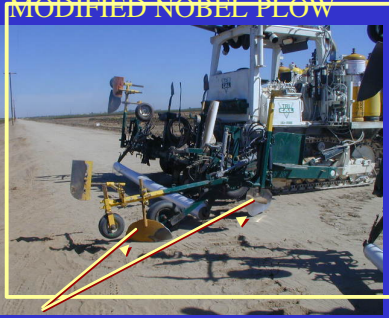
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FUMIGATION METHODS

MODIFIED NOBEL PLOW



Shovels

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dpr FUMIGATION METHODS
TARP/SALLOW/BED

- Maximum rate: 250 pounds / acre
- Rearward-curved (swept-back) chisels shall be used with either:
 - Closing shoes and compaction roller or,
 - Bed shaper or,
 - Combination bed former and bed shaper
- Injection depth: 6 - 15 inches
- Injection spacing: 12 inches or less

Methyl Bromide Training **3CCR 6450.3(a)(4)**

dpr FUMIGATION METHODS
TARP/SALLOW/BED

- Tarp options:
 - **Cut and remove:** cut no sooner than 5 days (120 hrs), remove after 24 hrs, and REI expires after removal (6 days)
 - **Cut only:** cut no sooner 5 days, REI expires 48 hrs after cutting (7 days)
 - **Tarp undisturbed:** REI is 14 days, and test less than 5 ppm

Methyl Bromide Training **3CCR 6450.3(a)(4)**

dpr FUMIGATION METHODS
TARP/SALLOW/BED

WHAT IS WRONG WITH THIS PICTURE ?



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dpr FUMIGATION METHODS
TARP/DEEP/BROADCAST

- Maximum rate: 400 pounds / acre
- Forward-curved chisels used with either:
 - Air fan dilution system on application tractor

or

- Closing shoes and compaction roller

- Injection depth: minimum of 20 inches

Methyl Bromide Training **3CCR 6450.3(a)(5)**

dpr FUMIGATION METHODS
TARP/DEEP/BROADCAST

- Injection spacing: 66 inches or less
- Tarp laid simultaneously by application tractor
- Tarp cut after 5 days (120 hours)
- Remove tarp 24 hours after cut
- REI:
 - Starts at injection.
 - Ends after tarp removal
 - Minimum of 6 days

Methyl Bromide Training **3CCR 6450.3(a)(5)**

dpr FUMIGATION METHODS
TARP/DEEP/BROADCAST



Shovel Copilot

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

- Maximum rate: 225 pounds / acre
- Injection depth: 1 inch
- Disconnect drip system from the water supply
- Bury all fittings and emitters 1 inch
- Check for blockage and leaks using air or water

3CCR 6450.3(a)(6)

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

Prior to fumigation:

- Place and secure tarp
- Inspect tarp for tears, holes
- Pressure test above ground fittings - 50 psi
- Use compressed air, water or nitrogen gas
- If using air or nitrogen, use soap solution to check for leaks
- Purge system of water using pressurized gas

3CCR 6450.3(a)(6)

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

Prior to disconnect:

- Purge MeBr from lines
- Pinch off drip line
- Disconnect tubing and secure
- Purge system of fumigant at end of day

3CCR 6450.3(a)(6)

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

- Use positive shut-off fittings for heat exchanger
- Handlers shall wear eye protection specified on the label when working with manifold or tubing containing fumigant under pressure
- REI: 3 options: cut and remove, cut only, or tarp undisturbed

3CCR 6450.3(a)(6)

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

Drip Line
Main manifold
MeBr Tank

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FUMIGATION METHODS

DRIP SYSTEM-HOT GAS

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EXERCISES

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WORKER SAFETY REQUIREMENTS

EXPOSURE RECORDS

- For all fumigation-handlers: shovelers, copilots, drivers and supervisors; tarp cutters and removers
- Include: handler's name, activity, date, work days/hours, duration, EPA registration number, brand name
- Maintain for two years at central location

3CCR 6784(b)(2)

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WORKER SAFETY RESPIRATORY REQUIREMENTS

- When required by these regulations, employees shall wear National Institute for Occupational Safety and Health (NIOSH)-certified respiratory protection, specifically recommended by the manufacturer for use in atmospheres containing less than 5 ppm methyl bromide, during the entire duration of the fumigation-handling activity.
- Air-supplying respiratory protection may be used in lieu of chemical cartridge respirators

3CCR 6784(b)(2)(C)

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Driver Shoveler Tarp Remover

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WORK HOUR LIMITS

Table 6-More than 3 Workdays per Mo.-w/Respirator

Method	Rate (lbs.)	Driver	Appliator	Shovel Copilot	Super-visor	Cutter	Removal
NT/S/Be	200	9*	NA	NA	9*	NA	NA
NT/D/Br	400	10*	NA	NA	No limit ¹	NA	NA
T/S/Br	400	8*	NA	4*	4*	No limit ¹	No limit ²
T/S/Be	250	No limit	NA	8*	8*	No limit ¹	No limit ²
T/D/Br	400	8*	NA	4*	4*	No limit ¹	No limit ²
Hot Gas	225	NA	5*	NA	5*	No limit ¹	No limit ²

3CCR 6784

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WORK HOUR LIMITS

Table 7-Three Workdays per Month-No Respirator

Method	Rate (lbs.)	Driver	Appliator	Shovel Copilot	Super-visor	Cutter	Removal
NT/S/Be	200	4*	NA	NA	4*	NA	NA
NT/D/Br	400	4*	NA	NA	7*	NA	NA
T/S/Br	400	4*	NA	3*	2*	4	7
T/S/Be	250	4*	NA	4*	4*	4	7
T/D/Br	400	4*	NA	2*	2*	4	7
Hot Gas	225	NA	2*	NA	2*	4	7

3CCR 6784

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WORKER SAFETY

WORK HOURS ADJUSTMENT

- Work hours may be increased if actual application rate is less than the method maximum rate
- **With or without respirator**
- Adjusted work hours = (max rate) actual application rate) x max hrs per 24 hrs

3CCR 6784(b)(6)

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FIELD POSTING

- Prior to fumigation
- Until the end of REI
- No fieldworker entry until REI elapsed and signs removed

3CCR 6776(f)

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EARLY ENTRY

- No entry allowed except to perform fumigation-handling activities
- Full face respirator must be worn except for:
 - Repair
 - Tarpaulin cutting
 - Tarpaulin removal



3CCR 6450.3(b)

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TARP REPAIR

RESPONSE PLAN

- Include in worksite plan
- Identify parties responsible for detection and repair
- Decision to repair made by a certified applicator:
 - Permittee
 - Authorized representative
 - Pest control operator

3CCR 6784(b)(6)

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TARP REPAIR

RESPONSE PLAN

- Decision factors:
 - Hazards to public, residents, or workers
 - Proximity to occupied structures
 - Size of damaged area
 - Timing of damage
 - Feasibility and response time of repair
 - Environmental factors (e.g. wind speed/direction)

3CCR 6784(b)(6)

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TARP REPAIR

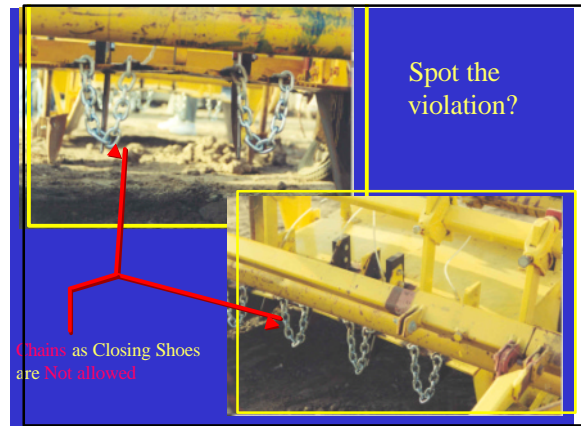
RESPONSE PLAN

- Repair requirements :
 - Testing must be done by certified applicator wearing SCBA
 - Less than 5 ppm, without respirator
 - 1 hour limit
 - Less than 5 ppm, with respirator
 - 10 hour limit
 - 5 ppm or more, SCBA required

3CCR 6784(b)(6)

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CEQA/PERMITS

- Assembly Bill 3765: alternative to Environmental Impact Reports for application of Restricted Materials
- Justification of equivalency based on state pesticide regulatory program:
 - Registration
 - Licensing
 - Monitoring of pesticide health and environmental effects
 - Regulation of use through the permit system

CEQA/PERMITS

The permit process includes provisions for:

- Implementation of mitigation measures as required for health and environmental safety
- Consideration of alternative methods and materials
- Denial when hazards cannot be mitigated
- Due process = review and appeal

**CEQA / PERMITS
PERMIT REVIEW**

- “Any interested person may request the CAC to review his or her action in issuing, refusing, revoking, suspending or conditioning a permit to use or possess a restricted material” CFAC Section 14009 (a)
- ENF Letter 98-030
- DPR Executive Office Letter 97-5

**CEQA/PERMITS
PERMIT REVIEW**

A request for a restricted material review shall be submitted in writing to the CAC by any interested person and include:

- Location of property to be treated
- Location of persons and property affected
- Name of the restricted material
- Name and address of the operator of property to be treated
- other info deemed relevant by CAC or filer

CEQA/PERMITS PERMIT REVIEW

CAC will review request and issue a decision within 10 days of receipt

- Undue hazard
 - Feasible alternatives
 - Mitigation measures
 - Local conditions
 - Likelihood that permit conditions will be violated
- Decisions may affirm, modify or cancel permit

CEQA/PERMITS PERMIT APPEAL

- CAC Decision may be appealed by a directly affected person to the Director
- Director will act on appeal within 10 days of receipt
- Director may stay permit until appeal is complete
- Any interested person can request that the appeal hearing be held in a public place

CEQA/PERMITS PERMIT APPEAL

Appeals limited to the following issues:

- Is proposed permit use consistent with label and regulations?
- Did CAC properly consider local conditions?
- Did CAC abuse his or her discretion?

Section 14006.5

